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Title: TA-55 Forensic Support Operations Cross-Training Exercise

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TA-55 Forensic Support Operations Cross-Training Exercise

Date of Exercise: FEB 12-13, 2020

Exercise Overview

As part of the annual FBI/LANL training schedule, a joint training exercise was conducted during the week of 10FEB2020 with FBI HEAT members and LANL Fissile Material Handlers (FMHs). The joint training exercise was conducted in a non-radiological area to reduce cost and ensure the test object would not be contaminated.

The exercise test object was fabricated by LANL using surrogate materials to represent an object containing Special Nuclear Material (SNM). Working with Jim Blankenship and Kevin Swearingen, functional requirements of the test object included the following: unclassified, disassembly (to include screws), and moderately heavy. To meet the objectives, the test object was fabricated by welding a custom aluminum box (8" x 8" x 12") with a lid which was secured by four (4) screws. The custom box housed a track and field shot put (16 lbs.) that was anchored by a hose clamp. The intent of the training was to disassemble the test object and conduct traditional forensic determinations on the parts. This lessons learned report documents all of the associated aspects related to the joint training effort.

Participation

DOJ/FBI:
Christa Mason, SRAU
Kevin Swearingen, SRAU
Nicole Bagley, HEAT
Kevin Brown, HEAT
Tina Felipe, HEAT
Dee Fife, HEAT
Heather Fosher, HEAT
Daniel Hatch, HEAT
Robert Kirkland, HEAT
Pablo Mercado, HEAT
Candie Shegogue, HEAT
AshLee Tayler, HEAT
Doug Anders, SRAU Unit Chief (Observer)
Kacey Gabriel, SRAU Section Chief (Observer)

DOE/LANL:
John Auxier, C-AAC
David Kunsberg, C-AAC
Felix Valdez, C-AAC
Dung Vu, C-AAC

Clint Stevens, DESH-TA55
Leisa Davenhall, PPMI-DO
Don Dale, PT-DO
Tenisha Highsmith, PT-DO
Alonso Archuleta, PT-3
Brian O'Neil, PT-3
Albert Hsu, SAFE-IP
Darrin Wallace, SAFE-IP

Scenario

The intent of the annual training exercise was to conduct cold pit assessment operations on the LANL test object and traditional forensic examinations in a manner to mimic PF-4 hot operations.

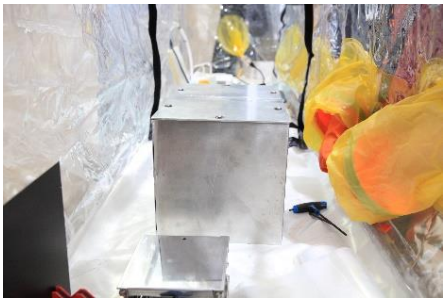

Figure 1. LANL Test Object

Figure 2. Forensic Examination Doghouse

Figure 3. FBI Photography Operation

Exercise Objectives

- Exercise receipt of FBI equipment and chemicals.
- Update annual LANL respiratory protection certification of FBI team.
    - Conduct respirator fit testing for visiting FBI team.
- Update all other LANL required training for visiting FBI team.
- Conduct training of 6 LANL Fissile Material Handlers on FBI forensic operations.
    - Following FBI instruction, conduct trace evidence analysis.
    - Following FBI instruction, conduct latent fingerprint chemical operations.

    - Following FBI instruction, support photography.
- Evaluate LANL worker and facility authorization (safety/security) procedures.
    - Setup an FBI "cold" training tent at SM-39.
    - Setup and authorize the stand-alone air handling and chemical ventilation scrubbing system to support doghouse fuming operations.
    - Exercise all requisite LANL worker authorizations.
    - Follow updated Integrated Work Documents (previous document was updated since the past exercise).
    - Exercise FBI camera (photography) authorizations for unclassified processing.
        - LANL requires authorization of all FBI cameras and associated data cards annually.
        - Setup unclassified computer workstation to allow for FBI staff to conduct fingerprint photo processing.

Exercise Observations

1) **FBI clearance transfer**

   Observation: FBI was able to receive classified badging.

   Analysis: Badge processing was completed successfully without delays or issues.

   Recommendation: Follow the same process and timeline for submission of the classified visit and clearance requests as completed for the FY2020 exercise.

   Action: 55FSO team will communicate the positive feedback regarding badge processing to the Badge Office.

2) **Receipt of FBI chemicals and equipment**

   Observation: The receipt exercise was moderately successful.

   Analysis: An FBI package which contained a partial shipment of chemicals for fuming operations was lost/misplaced and not located until the second day of the training exercise. In order to continue the training exercise, an alternative method for fuming operations was used which required a hot plate to generate the heat for the exothermic reaction in place of the missing chemicals. In addition, this package contained hazardous chemicals and was shipped in non-hazardous packaging.

   Actions: LANL will verify receipt of every FBI shipment prior to the visit to ensure all items received. In addition, LANL will confirm with the FBI that hazardous/non-hazardous shipments are properly packaged before shipped.

3) **Internal LANL procedural work authorization documentation**

Observation: The IWD and training tent work authorizations resulted in minor delays with the exercise operations. Conducted dry walkthroughs until proper authorizations were obtained.

Analysis: Relative to previous annual training events, the authorization process for 2020 was more complex and required additional review and signatures. As an example, the tent and doghouse had to be commissioned for use, requiring sign-off by industrial hygiene, deployed safety professional, radiation protection, fire protection, occupational safety and health, responsible line management, facility operations, and emergency response.

Action: Ensure IWD revisions are in place well ahead of the training exercise. If space allows, set-up and commission the tent a week before the cross-training drill to avoid last minute authorizations and signatures.

4) **FBI annual respirator fit testing and other training**

Observation: Respirator fit testing was not conducted due to inclement weather resulting in a Laboratory closure on 12FEB2020. LANL Industrial Hygiene (IH) had limited scheduling availability in the days following the closure. The training exercise was completed without the use of respirators.

Actions: Pursue two paths: 1) reschedule respirator fit testing during the next exercise and/or 2) set-up a meeting with the FBI, LANL Respiratory Protection, and LANL Legal to see if the Lab will allow FBI respirator use onsite.

5) **Tent & glove bag operations**

Observation: The dual chambered glove bag was adequate to accomplish the goal of conducting fuming operations in one section and photography in the other. While adequate, there were a number of identified improvements.

- The bottom of the glove bag was crumpled which made an uneven surface. Recommend placing/inserting two flat metal plates on the bottom of the glove bag to level and stabilize the plastic fabric.
- The glove bag was set up on adjustable height tables at a fixed working height which presented ergonomic issues during operations (e.g., table too low for personnel). A manual hand crank could have been utilized to adjust the working height of the table but access was obstructed.
- Communication was improved through the use of dry-erase boards. Consider another communication method when wearing respirators to enhance communications.
- Fuming Operations:
    - On the first day of the exercise, fuming operations could not take place with the air handler running. Authorizing Industrial Hygienists (IH)

allowed the air handler to be turned off during fuming, with the control that all personnel vacate the tent area. This procedural modification worked well. However, in a contamination environment, there would not have been sufficient time for full tent evacuation. A staggered exit might be possible.
    - On the second day of the exercise, the ventilation system was modified to allow personnel to remain inside the tent during fuming operations. This system modification worked well and recommend using the same configuration in future exercises.
- Large and/or heavy objects would be difficult for one operator to safely handle. Recommend using a glove bag design with glove ports on each side to allow for two operators to handle the test object.
- FBI photographers requested LANL add a window between the glove ports or on one the side of a glove port and on the angled section of each doghouse chamber. Tempered glass or quartz windows would be adequate. Refer to Figure 4 for the proposed locations (green) of the additional photography windows.
- One exercise deviation was to allow play without respiratory protection (RP). Under most anticipated real-world scenarios all tent and glove bag operations would require a full-face respirator. Even without RP, the personnel noted heat-related issues. During a real event, the activity durations would have exceeded the exercise play. Recommend researching engineering controls (e.g., air conditioning/cooling fans or increased ventilation), implementing administrative controls (e.g., mandatory breaks), or utilizing personal protective equipment options (e.g., cooling vests) to manage the heat-related issues.
- The standalone ventilation system worked very well. This standalone system allowed for the tent to be set up without consideration of facility chemical hoods.

Analysis: Based on the observations and comments from the LANL and FBI HEAT teams, the doghouse should be redesigned to include glove ports on each side and additional photography windows at the locations identified by the FBI photographers.

Actions:
1. LANL will order adjustable height stainless steel tables with accessible cranks to set up the glove bag.
2. LANL will utilize the new glove bag which has the glove ports on each side and provide photography windows at the designated locations to allow photography between the glove ports/side of glove port and angled sections of the doghouse chambers.
3. LANL will evaluate engineering controls and personal protective equipment options to manage heat-related issues inside the tent.

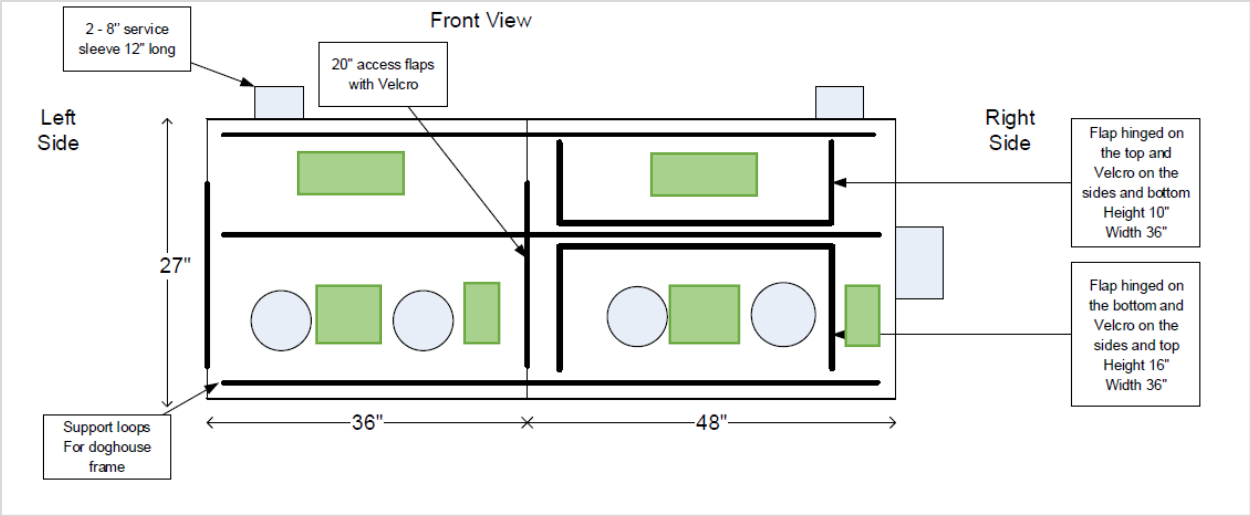

Figure 4. Dual Chamber Doghouse - Proposed Locations of Additional Photography Windows (Green Boxes)

Future Exercise Improvement Opportunities

1. Provide LANL site access and training requirements to the FBI ahead of the joint training exercise. The requirements will be provided on an annual basis and updated based upon protocol changes.
2. Consider LANL FMH teams compromised of 1 Chemist and 1 PT-3 Assembly Representative for evidence handling operations.
3. Provide Tyvek suits in smaller sizes.
4. Consider the use of a critical safety can for conducting FBI dark operations.
    a. Action for FBI
5. Consider the use of a LANL-approved laser pointer (Class I or Class II) during the training exercise. Laser pointers are routinely used by FBI examiners to assist with the identification of evidence and would be advantageous in providing evidence handling instruction to the Fissile Material Handlers. Alternate Option: LED Pen Light.

Future Exercise Objectives

1. Conduct operations in PF-4 using a classified, non-nuclear test object. LANL/FBI will determine frequency of training in PF-4 versus cold areas such as SM-39. Due to space limitations at SM-39, LANL will investigate the possibility of using the basement of NISC building at TA03. This space has supported a previous exercise. While there is value in conducting operations in PF-4, there are associated cost and scheduling issues.
2. Conduct operations using newer tent and redesigned glove bag with additional glove ports and photography windows.
3. Conduct operations in full PPE.
4. Conduct operations with RCT participation.
    a. RCTs can provide guidance regarding donning/doffing PPE, tent entry/exit protocol, and test object handling.
    b. Personnel Requirement: 2 RCTs (1 RCT for inside tent operations and 1 RCT for vestibule monitoring)

        i. Consider participation of the Emergency Response RCT (Tunnel Operations Support) in the training exercise.
5. Exercise LANL security derivative classification review of classified/unclassified of photographs and other documents.
6. Suggested training schedule:
    a. Day 1:
        i. Dedicate day for respiratory training and fit testing. While part of the team is being fit tested, the others could be completing training and unpacking equipment/supplies.
    b. Day 2
        i. Dedicate ½ day for tent and glove bag training in the morning.
        ii. Dedicate ½ day for tent and glove bag training in the afternoon.
    c. Day 3:
        i. Dedicate ½ day for tent and glove bag training in the morning.
        ii. Dedicate ½ day for packing supplies/equipment and exercise debrief/recap.

Appendix A. Authorization Documentation

ATTACHMENT 3: TEMPORARY ENCLOSURE COMMISSIONING CHECKLIST

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Temporary Enclosure (TE) Location: SM-39	TE ID: FRIMOD-3	TE Release Date:

Functional Area	Inspection Items	Date Accepted	Comments
Industrial Hygiene & Safety (OSH-ISH)/Radiation Protection (RP)	1. Entrance and egress are per Requirements Document.	2/12/2020	Good per Conversation & SRW
	2. Doors are functioning per Requirements Document.	2/12/2020	"
	3. Illumination is per Requirements Document.	2/10/2020	
	4. Humidity and temperature is acceptable or air is treated, or administrative controls are in place.	2/10/2020	
	5. Noise level is acceptable or controlled using the hierarchy of controls.	2/10/2020	
	6. Access to work points is acceptable.		
	7. Traffic flow within TE is per Requirements Document.	2/10/2020	Based on info available
	8. The TE and its related hazards are included in the IWD.	2/10/2020	
	9. TE static pressure is maintained at designed level. The directionality of airflow has been verified when all LEVs and dilution ventilation are running, and all combinations of open and closed points of entrance and egress have been tested.	2/10/2020	
	10. Ergonometric problems in work area or with equipment have been mitigated.	2/10/2020	
	11. Hot and cold surfaces have been shielded to prevent contact.	NA	
	12. Hazardous materials are properly labeled and secured in the TE.	2/10/2020	
	13. TE and TE-related hazards are included in the Integrated Work Document (IWD).	2/10/2020	
	14. If HEPA filtration is required: • HEPA filter differential pressure is per Requirements Document. • Differential pressure: 0.5" WG /Air Mover flow (CFM) • HEPA-filtered ventilation is properly installed and connected.	2/10/2020	
	15. HEPA filtered dilution and LEV systems are certified (i.e., inspected and performance tested).	2/10/2020	
	16. Controls are adequate for radiological and non-radiological hazards.	2/10/2020	charcoal filter installed inline
	17. Any required LEVs are positioned over work points and functional.	NA	
	18. Exhaust from LEVs and dilution system is properly vented.	NA	
	19. If applicable, installed charcoal adsorbers are adequate for the job.	2/10/2020	

ATTACHMENT 3: TEMPORARY ENCLOSURE COMMISSIONING CHECKLIST

Functional Area	Inspection Items	Date Accepted	Comments
Industrial Hygiene & Safety (OSH-ISH)/Radiation Protection (RP) (cont.)	20. Doffing and waste areas properly set up.		
	21. Necessary radiological and industrial hygiene monitoring established and defined within the Radiation Work Permit (RWP) and the Work Document.	NA	
	22. Service lines within enclosure don't present a tripping hazard.	2·10·20	
	23. Services penetrations to TE are properly sealed.	2·10·20	
	24. TE is properly posted for radiological hazards.	2·10·20	
Fire Protection	25. The required fire-suppression equipment is present within the TE and is suitable for all classes of fires that may occur inside the TE	2·12·20	ABC fire extinguisher mounted on column adjacent to TE.
Owning Organization Responsible Line Manager or Designee	26. TE is properly oriented and supported.		
	27. If needed fire watch and emergency alert has been planned.		
	28. Sharp objects have been secured to prevent loss of TE integrity.		
	29. All activities that will be performed in the TE are identified on the IWD.		
Nuclear Criticality Safety	30. If needed, engage The Nuclear Criticality Safety Division for criticality safety evaluation (Reference NCS-AP-004).		
Emergency Management	31. IWDs identify unique issues needed by Emergency Management personnel.		
	32. Instructions and signs are posted for workers in the event of an emergency.		

ATTACHMENT 3: TEMPORARY ENCLOSURE COMMISSIONING CHECKLIST

Approvals: *The signatures below indicate that*

1. *the TE, the activity, associated hazards, and specified controls have been evaluated and incorporated into the work document;*
2. *this checklist has been adequately completed; and*
3. *the TE is approved for operation.*

	Name	Signature	Date	Z-Number
Deployed Industrial Hygienist (IH)	Mark Mullis	Mark Mullis	2/10/2020	238137
Deployed Safety Professional (SP)	Mark Mullis	Mark Mullis	2/10/2020	238137
Deployed Radiation Protection (RP) Professional	Clint Stevens	Clint Stevens	2/10/2020	208649
Deployed Fire Protection Engineer (FPE)				
OSH/RP Temporary Enclosure (TE) SME (e.g., ALARA Center SME)	Clint Stevens	Clint Stevens	2/10/2020	208649
Fire Protection (FP) Subject Matter Expert (SME)	Shaun Wightson	Shaun Wightson	2/12/2020	341746
Responsible Line Manager (RLM)				
Facility Operations Director (or designee)				
Crafts Supervisor				
Emergency Response	Jeffrey H. Dare	Jeffrey H. Dare	2/12/2020	106207
Criticality Safety Analyst (If needed)				

ATTACHMENT 4: RADIOLOGICAL GLOVE BAG INITIAL INSPECTION AND ACCEPTANCE CHECKLIST

Glove-bag location: SM-39 **Glove-bag ID:** LI-351-PC-1

Functional Area	Inspection Items	Date Accepted	Comments
Industrial Hygiene & Safety (OSH-ISH)/Radiation Protection (RP) (cont.)	1. Controls are per the Requirements Document or radiological hazards and industrial hygiene hazards.	2/10/2020	
	2. If specified, glove-bag ventilation is per the Requirements Document (~~air changes/hour with a minimum of 4 air changes per hour~~) 0.5" WG	2/10/2020	
	3. Required HEPA filtration is installed per the Requirements Document.	2/10/2020	charcoal filter added.
	4. The glove-bag and its related hazards are included in the IWD.	2/10/2020	
	5. All seams are complete; no holes or tears are present in the fabric.	2/10/2020	
	6. Containment bag component seal is properly made.	2-10-2020	
	7. Illumination is in place per the RD.	2/10/2020	
	8. When equipment or materials have sharp edges or points they are required to be secured to prevent injury to workers and loss of integrity of the glove-bag.	2/10/2020	As of the time of signature @ 1330.
	9. Piping and equipment that protrudes from the glove-bag are sealed.	2-10-2020	
	10. The correct gloves for the operation are installed and oriented in the correct position to perform the operation.	2-10-2020	
	11. An Inspection Tag is in place.	2-10-2020	

To insert additional inspection criteria, add rows to the table.
Write NA if an item is not applicable.

ATTACHMENT 4: GLOVE BAG INITIAL INSPECTION AND ACCEPTANCE CHECKLIST

The signatures on the glove bag initial inspection and acceptance indicate that:

- *The glove-bag, the activity, associated hazards, and specified controls have been evaluated and incorporated into the activity IWD;*
- *This checklist has been adequately completed; and*
- *The glove-bag is approved for operation.*

	Name	Signature	Date	Z-Number
Deployed Industrial Hygienist (IH)	Mark Mullis	Mark Mullis	2/10/2020	238137
Deployed Safety Professional (SP)	Mark Mullis	Mark Mullis	2/10/2020	238137
Deployed Radiation Protection (RP) Professional	Clint Stevens		2/10/2020	
Deployed Fire Protection Engineer (FPE)				
OSH/RP Temporary Enclosure (TE) SME (e.g., ALARA Center SME)	Clint Stevens		2/10/2020	
Fire Protection (FP) Subject Matter Expert (SME)	Shaun Wightman		2/12/2020	348746
Responsible Line Manager (RLM)				
Facility Operations Director (or designee)	Edward Gregson		2-12-2020	134628
Crafts Supervisor				

ATTACHMENT 5 – TEMPORARY ENCLOSURE INSPECTION CHECKLIST

Instructions

1. The RLM, IH, or RP enters the date and initials each satisfactory item.
2. If an item is not satisfactory, write "fail" for that item.
3. If an item is not applicable, write "NA."
4. To insert additional inspection criteria, add rows to the table.

Temporary Enclosure (TE) Location	TE ID
SM-39	FBJ MOD-3

Date	2/10/2020									
Physical integrity of TE is satisfactory.										
Postings are visible and accurate.										
Housekeeping satisfactory, including combustible materials.										
Waste boxes, step-off pad, and doffing area are satisfactory.										
TE ventilation and filter are working; DOS test is current.										
The negative static pressure is maintained at designed level of ___.										
Inspection of TE interior is satisfactory.										
Required fire suppression equipment is present.										

PIC initials										
Fire Protection Engineer (FPE) (when applicable)*										
ALARA Center SME										

The FPE, IH, and RP must perform an inspection at a 30-day interval. The ALARA Center SME must inspect outdoor TEs after severe weather, and after repair, modification, or a failed inspection.

ATTACHMENT 6: GLOVE BAG INSPECTION TAG

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Glove Bag Inspection Tag			
RWP No: N/A			
Installed By: James Mulcahy			
Date: 2-10-2020			
Initial Inspection By: CL			
Date 2-10-2020			
Record of Routine Inspection			
Pass/Fail	Date	Time	Signature
Pass	2/10/20	1515	CL